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NOTES ON UNUSUAL MASSES OF PLATTNERITE

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New Haven, Connecticut

PLATTNERITE, lead dioxide, as a mineral species was first identified from Leadhills, near Wanlockhead, Scotland. A number of specimens were described from this locality between the years 1837 and 1889, the mineral in all cases occurring as black botryoidal crusts associated with pyromorphite and cerussite. In May, 1889, W. S. Yeates identified as plattnerite a specimen from the You Like lode in the Coeur d'Alene District, Idaho. Study of material from this occurrence revealed minute prismatic crystals of tetragonal symmetry.[1] This paper contains the most complete statement of the history and properties of this species that has yet appeared.

Apparently a considerable number of specimens of the mineral from the Idaho locality were obtained by collectors, as it is represented in almost every large collection in the country and several specimens are still in the hands of dealers. The mineral seems never to have been certainly identified heretofore in the numerous other American localities for lead minerals. It has been reported from the Black Hills, the Castle Mountain District in Montana, and from several other places in this country, but the report has in no case been verified. The dioxide is doubtless one of the rarer natural compounds of the metal and for that reason the following notes are considered worthy of record:

Among the men who were active in placing the original find of American plattnerite within the reach of collectors was J. Rand Sanborn, late of Coeur d'Alene City, who did a considerable business in plattnerite specimens from the You Like locality at the time it was first described. Mr. Sanborn in 1914 told the writer of the largest single mass of the mineral known to have been obtained from the You Like lode. This mass, found in 1892, was a single flat nodule weighing in excess of 200 pounds, and very pure with a cavity in the center several inches in diameter, lined with brilliant crystals of plattnerite, some of which were said to be half an inch in length. This mass was merely broken into two pieces, carried a short distance from the portal of the tunnel in which it was found and "cached" in a hole dug in the ground to receive it. It was planned to sell this find entire to George L. English & Co., then of New York, but when the owners returned to claim the mineral they found that it had been stolen. Probably the thieves simply rehid the mineral a short distance from the original hiding place and never returned for it as no part of it has ever appeared on the market. Judging from the fact that a small specimen showing crystals one fiftieth of an inch long recently changed hands at a price of $40, the market value of this mass must be considerable. The existence of crystals of such size has not been demonstrated. In all probability this mass will never be refound. The You Like locality has produced none of this mineral for many years, the stopes from which it came having long since been worked out and abandoned.

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[1] *Am. J. Sci.* [3], **43**, 407, 1892.

A story which relates to a second large nodule, emphasizing the unusual tenacity of the mineral when in pure masses, is told by Mr. James Porter of Spokane. During a visit to the upper workings of the Mammoth Mine, in the early days of the Coeur d'Alene District, Mr. Porter observed a lump of a heavy black mineral "as large as an office wastebasket and weighing hundreds of pounds." The miners shot this mass down and after breaking the handles from two heavy hammers in trying to crack it up, the foreman concluded that it was "only worthless iron anyway," and with difficulty, owing to its weight, it was loaded on a truck, hauled out, and rolled over the dump One chip from this mass, preserved in the Porter collection in Spokane, is pure massive plattnerite.

During the years from 1908 to 1913, the writer kept a keen watch on all mines producing oxidized ore, without finding a trace of the mineral. In May, 1913, Mr. Henry Savage of Wardner, Idaho, while visiting a lease on the upper tunnel of the Mammoth Mine, recognized the high specific gravity of a black mineral which was being discarded as "iron" and brought specimens to the writer. These were immediately recognized as plattnerite. A number of small masses from this find were later obtained through the courtesy of Mr. Savage.

Mr. Drew Peeples of Wardner remarked, upon examining specimens of the mineral, that he "didn't know what it was, but it was good lead ore, and he had seen quite a lot of it in the Bunker Hill open cut."

In 1914 certain pieces of heavy black material were picked from the sorting belt at the Arizona tunnel of the Last Chance Mine. An argument arose among the ore sorters as to whether this material was "zinc" or "iron." Pieces referred to the author by Alva Brown consisted of pure plattnerite.

In September, 1915, there was found on the dump of an abandoned tunnel of the Hercules Mine, at Burke, a very fine botryoidal piece of plattnerite having a brilliant submetallic luster. Search failed to reveal any more of this material but a man familiar with the oxidized ores of this mine, who examined the specimen, said he had often seen it there.

In January, 1916, Mr. Frank Grooms of Gilmore, Idaho, sent the writer a box of specimens of very pure minium from the Idaho-Democrat Mine in the Gilmore District. One specimen of this lot consists of about equal parts of plattnerite and minium. This locality is far distant from those previously described. There are several other interesting minerals associated with this minium, and it is planned to incorporate descriptions of these in a subsequent paper.

The indications are that plattnerite occurs widely in the lead mines of the Coeur d'Alene District and the suggestion is warranted also that it may have been overlooked in a number of western mining districts because of its resemblance to oxides of iron and manganese. The hardness and high specific gravity, however, are distinctive characteristics, as are its ease of reduction and low fusing point.

By a curious coincidence the first names of all of the contributors to this number begin with an E. This impels us to remind our readers that we will be glad to receive articles from anyone, even tho his name begins with some other letter! Brief, non-technical accounts of trips or descriptions of collections will be especially welcome. We also again call attention to our standing offers to print exchange notices and to identify specimens for subscribers, without charge. THE EDITORS.

MASSICOT AND LITHARGE, THE TWO MODIFICATIONS OF LEAD MONOXIDE[1]

ESPER S. LARSEN

U. S. Geological Survey

WHILE measuring the optical properties of natural "massicot" it was noticed that the plates are made up of two minerals with distinct optical properties, which correspond to those of the two modifications of artificial lead monoxide. The centers of the plates are like the artificial yellow, orthorhombic modification (litharge), while the borders are like the artificial red, tetragonal one. It is proposed that the name *massicot* be confined to the tetragonal modification, and that the name *litharge* be applied to the orthorhombic modification, now recognized for the first time as a distinct mineral species.

Specimens from Austria and from Kern and San Bernardino counties, California, as well as both artificial forms were carefully examined and in all of the natural crystals the central portion was found to be litharge and the border massicot. It is believed that the massicot is an inversion product of the litharge.

In all cases the natural crystals are very similar and only the material from Cucamongo Peak, San Bernardino County, California, will be described.

It is in brownish-orange-red scales up to 1 millimeter across, very soft, and made up of litharge and massicot in about equal amounts, the latter forming the borders of the plates.

Under the microscope the litharge is nearly colorless and lies on plates sensibly normal to X (possibly Y) and is biaxial,+. The index of refraction, $\beta=2.61\pm.04$; the birefringence is very strong.

The massicot is yellow-orange in section, nearly or quite uniaxial, optically −, and has the optic axis normal to the plates. Its index of refraction $\omega=2.64\pm.02$; the birefringence is very strong.

For comparison the properties of the natural and artificial forms are given in table 1.

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[1] Published with permission of the Director of the U. S. Geological Survey.

TABLE 1

	Crystal system	*Habit*	*Cleavage*	*Optical character*	*Optical orientation*	*Index of refraction*	*Birefringence*	*Sp. gr.*
Litharge	Orth.?	Tablets		Biaxial +	X (possibly Y) normal to plates	2.61[a]	Very strong	
Artificial yellow modification (litharge)[b]	Orth.?	Tablets (100)	(001) Perfect	Biaxial +	Y (?) normal to cleav.	2.61	Very strong	9.290
Massicot	Tet.?	Tablets (001)		Uniaxial −		2.64[a]	Very strong	
Artificial red modification[b]	Tet.	Tablets (001)	(110)	Uniaxial −				9.125

[a] The value of n, 1.735, given for massicot by Scott in *Min. Mag.* **17,** 143, 1914, is obviously in error. A lead mineral with the specific gravity of massicot and so low an index of refraction would be very remarkable.

[b] See Groth, *Chem. Krystallographie.* I, 76, 1906.

NOTE ON THE NOMENCLATURE OF THE LEAD MONOXIDE MINERALS. EDGAR T. WHERRY.—The principle of making mineral names (except those like quartz, which have great antiquity) end uniformly in *ite* has for many years dominated American mineralogical nomenclature, and seems worth applying to all new or reëstablished species, unless some very cogent reason for exception exists. "Massicot" and "litharge" as such are chemists' names for artificial products; but both admit of adding the mineralogical termination without essential change. *Massicotite* was indeed proposed by D'Achiardi in 1883; and it is now recommended that the form of lead monoxide corresponding to artificial litharge, above shown by Mr. Larsen to deserve separate recognition as a mineral species, be known to mineralogists as *lithargite.*

THE OPTICAL PROPERTIES OF PENFIELDITE[1]

ESPER S. LARSEN
U. S. Geological Survey

Penfieldite was originally described from Laurion, Greece, where it occurs in hexagonal prisms with distinct basal cleavage, strong double refraction, and optically positive character. The author measured the following optical constants on a specimen of the mineral kindly furnished by Colonel Washington A. Roebling of Trenton, N. J.:

Uniaxial; +; $\omega = 2.13$; $\epsilon = 2.21$ both ± 0.01; birefringence 0.08.

A specimen labeled "penfieldite, Tintic District, Utah," in a Survey collection, transmitted to the United States National Museum in 1902 (No. 85013) altho identical in appearance with penfieldite has the following optical properties, and is thus shown to be unquestionably a different mineral: Uniaxial; −; $\omega = 2.14$, $\epsilon = 2.13$, both ± 0.01; birefringence thus about 0.01. It has since been crystallographically and chemically examined by Dr. Wherry and proves to be mimetite. A full description of this unusual occurrence will appear in the *Proc. U. S. Nat. Museum.*

IS PARTSCHINITE A DISTINCT SPECIES?[1]

ESPER S. LARSEN

Partschinite is described as occurring in small, dull, monoclinic crystals somewhat resembling augite, in the auriferous sands of Olopian, Transylvania. It has the same physical properties as the garnet, spessartite, but is said to differ from spessartite in crystal symmetry.

A specimen of partschinite from the type locality, kindly furnished the author by Colonel Washington A. Roebling, when examined under the microscope proved to be nearly colorless and isotropic in section and to have an index of refraction of 1.787 ± 0.003; it is no doubt ordinary garnet, near spessartite.

It therefore seems probable that the "partschinite" crystals are merely distorted garnet crystals, or possibly paramorphs of garnet after a monoclinic form.

The author would be glad to receive other specimens of "partschinite" so that the data may be further checked. A crystal or fragment the size of a grain of wheat is ample. Exchange can be arranged with the U. S. National Museum.

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[1] Published with permission of the Director of the U. S. Geological Survey.

BOOK REVIEW

MICROSCOPICAL DETERMINATION OF THE OPAQUE MINERALS. JOSEPH MURDOCH, of Harvard University. 165 pp. Wiley and Sons, *New York, 1916*.

Metallography, the study of metals by polishing and etching their surfaces, and examining them under the microscope with vertical illumination, is widely practised, but *mineralography*, as the corresponding method of investigation applied to opaque minerals is termed in this volume, is but little known. Dr. Murdoch's pioneer work in this field is thus of great importance, and is presented in the book before us in a most useful form, comprising an elaborate account of the history of mineralographic work, a brief discussion of methods, and the presentation of the results of the examination of no less than 186 opaque minerals. The latter are arranged in a well worked out determinative table, based primarily on color, hardness, and behavior toward certain reagents.

One of the most interesting chapters is that entitled "Mineral composition and identity," in which the frequency of inclusions in opaque minerals is demonstrated, and the erroneous conclusions as to their composition usually drawn are pointed out. Many supposed mineral species are shown by mineralographic examination to be mixtures, and their withdrawal from mineralogic literature is recommended; some of the most important of these are as follows (listed by reviewer according to Dana's classification):

II. Sulfides, etc. A. Basic division: Algodonite, animikite, domeykite, keweenawite, mohawkite, and temiskamite;

C. Intermediate division: Barnhardtite, carrollite, and cubanite;

D. Disulfide division: Alloclasite;

III. Sulfo-salts. Brongniardite, klaprotholite, kobellite, plenargyrite, schapbachite, and tapalpaite.

On the other hand the existence of several new minerals is indicated by these studies, of which, as examples, may be mentioned: "orange bornite," orange yellow to yellow-brown inclusions often observed in ordinary bornite; "purple galena," a pale purplish gray mineral resembling galena in some respects, occurring associated with silver and niccolite; and "cream mohawkite," one of the constituents of the supposed species mohawkite and other similar materials. The compositions of these remain to be ascertained.

Dr. Murdoch's observations are most valuable, but it is to be regretted that he has not been able to "tie up" the compositions of the various minerals studied with their properties in more cases. Bornite it has been possible to analyze, and material determined by mineralographic examination to be free from inclusions has always proved to have the formula Cu_5FeS_4, a correction of the one given in most books; the crystals of smaltite and related minerals are shown in this way to be zoned, and "it is accordingly not surprising that analyses, even of crystals, have given variable results, and consequently some of the formulas assigned to these minerals are probably wrong." But in the vast majority of cases formulas are taken bodily from Dana and other sources without critical examination and without intimation that there is any doubt about them. In one case, chilenite, p. 125, the formula given (copied from Dana), is certainly wrong, as a moment's calculation from the analyses will show: it should be $Ag_{10}Bi$, rather than Ag_6Bi. In another, melonite, the latest work indicates $NiTe_2$ rather than Ni_2Te_3. In others formulas are used which have been calculated on the assumption that the analytical results are far more accurate than is usually the case, as for instance hauchecornite, which is given the ratio metal: acid = 7: 8, but for which 1: 1 seems more probable; polydymite, the isomorphism of which with linnaeite shows its ratios to be 3: 4 rather than 4: 5; and nagyagite, for which Hintze's ponderous formula, $Au_2Pb_{10}Sb_2Te_6S_{15}$ is retained.

Another possibility which is not considered is sub-microscopic intergrowth. As the reviewer has repeatedly pointed out, microscopic visibility ceases at about one-half the wave length of light, but mineral particles somewhat less than this size contain many thousands of molecules or atoms, and are therefore capable of individual existence, even tho invisible. The presence of such particles is the probable explanation of many of the apparent abnormalities in composition of certain minerals, so it is by no means safe to say that such minerals, of which steinmannite, antimoniferous galena, is a typical example, have the "extra" elements chemically combined, merely because the microscope shows no admixture.

These faults, however, do not detract essentially from the worth of Dr. Murdoch's contribution, which represents a most valuable addition to the literature of mineralogy. E. T. W.

HOW TO PREPARE A SPECIMEN FOR MINERALOGRAPHIC STUDY

THE EDITORS

A FLAT surface a centimeter or two square must first be cut, for which purpose a carborundum wheel run at 1,000 revolutions or so per minute gives the most rapid results, altho the work may be done by hand, using a slab of carborundum or even loose powder—60 or 80 mesh—on a wet iron plate. The edge of the ground face should be beveled off all the way around. The specimen and the hands of the operator must then be carefully rinsed to remove *all* grit. This surface is ground smooth with moistened carborundum or emery flour—200 or 220 mesh—on stretched canvas, or on a smooth plane surface like that of a sheet of glass. After another rinsing the surface is polished with rouge or "putty-powder" on stretched cloth or chamois skin, and if necessary a final polishing is given with specially floated rouge on fine textured linen. Specimens too small to be held in the hand while grinding may be embedded in sealing wax. To obtain a really good reflecting surface requires considerable care and skill, which comes only as a result of long practice, but the amateur can readily polish a piece of a mineral like ordinary bornite to such a degree that its lack of homogeneity is easily seen.

The specimen must then be mounted so that its polished surface may readily be made perpendicular to the axis of the microscope; this is best accomplished by attaching it by means of a lump of modeling wax or clay to a large microscope slide (or a metal strip of like dimensions) and pressing it down by a sheet of glass kept strictly parallel to the surface of the slide; Murdoch advises the use of a metal ring of uniform height within which the specimen is placed, and down to which the glass sheet is pressed, forcing the specimen beneath it into the wax.[1]

Any ordinary microscope in which the tube can be well drawn up may be used for the examination. A vertical illuminator is inserted above the objective; this is a device which reflects a ray of light projected into it laterally down thru the objective on to the surface of the specimen. The light may be clear sky light, or may be obtained from an electric arc shielded by a ground glass screen, or from a gas-filled tungsten incandescent light provided with a light-filter to render its rays white. Oblique light should be excluded except where definitely needed for the study of non-opaque minerals in the specimens. A magnification of about 50 diameters is usually most convenient.

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[1] See also Brokaw, *J. Geol.*, **24**, 718, 1916.

In addition to the features of the minerals brought out by polishing, microchemical tests on the polished surfaces often yield valuable information. Reagents may be applied by glass tubes drawn out to fine points, or by strips of filter paper. Murdoch has found the following most useful: HNO_3 1:1, HNO_3 concd., KCN (20% soln.), HCl 1:1, HCl concd., aqua regia, $FeCl_3$ (20% soln.) and KOH in concd. soln. Details of the results thus obtained are tabulated in Murdoch's book.

A number of the rarer opaque minerals have never been studied mineralographically, and indeed, the compositions of many that have been thus studied are by no means established, so it is evident that a considerable field for investigation lies open to anyone who cares to take up mineralographic work.

PROCEEDINGS OF SOCIETIES

New York Mineralogical Club

At the regular meeting held at the American Museum of Natural History on December 13, 1916, there were forty-four persons present, Mr. James G. Manchester presiding.

After the usual routine business the secretary gave notice that on Pavilion Hill, Staten Island, in the Borough of Richmond, New York City, excavations were in progress which afforded a long sought opportunity for the collection of excellent specimens of the Staten Island serpentine and associated minerals.

Dr. Waldemar T. Schaller, of the U. S. Geological Survey, then presented the announced paper of the evening on "The so-called pseudomorphs of the New Jersey zeolite region." He objected to the customary application of the term pseudomorph to the cavities, which should be called molds. The term pseudomorph should be limited to solid replacements of fillings, such as the cores which occur in and fit certain of the molds at McKiernan & Bergin's Quarry in West Paterson. He approved the theories of Allen & Wherry that the rectangular and lozenge-shaped cavities were originally crystals of anhydrite and glauberite respectively, and disapproved of the theory which attributed them to babingtonite. He then reviewed and favored a hydrothermal theory as to the origin of the anhydrite and glauberite. Upon its conclusion questions were asked and the paper was discussed by Messrs. Cahn, Allen, Kunz, Levison and others, and from the tenor of the remarks made it seemed that the theory of the origin of the anhydrite and glauberite proposed was not convincing to everyone. The paper was liberally illustrated with lantern slides and specimens.

Mr. James G. Manchester jointly with Mr. Gilman S. Stanton then presented the second announced feature of the evening, an exhibit of a series of small spessartite garnets cut from a fragment of a transparent crystal they found at Haven Avenue, between 178th and 179th Streets, in the Borough of Manhattan, as the first gem garnet found in New York City.

Wallace Goold Levison, *Secretary.*

THE PHILADELPHIA MINERALOGICAL SOCIETY

Wagner Free Institute of Science, December 14, 1916

A JOINT meeting of the Philadelphia Mineralogical Society and The Philadelphia Natural History Society was held on the above date, with President Trudell in the chair, the occasion being a lecture by Dr. Henry Leffmann, on "Meteorites."

The following members were present: Messrs. Allen, Bradford, Benge, Cameron, Egee, Gordon, Hagey, Jones, Knabe, Leffmann, Rothermel, Trudell, Vanartsdalen, and Warford.

A brief business meeting was held after the lecture. Mr. Knabe reported a trip to Worrall's farm, Upper Providence, Delaware Co., finding andalusite. Mr. Vanartsdalen had visited Sandbrook and Brookville, near Lambertville, without much success.

SATURDAY, MARCH 3, 1917; trip to Wissahickon localities; meet at Ridge Ave. and School Lane at 1.45 P. M. SAMUEL G. GORDON, *Secretary.*

THE MINERALOGICAL SOCIETY OF GREAT BRITAIN

London, November 7, 1916; Anniversary meeting; MR. W. BARLOW, president, in the chair.

DR. J. W. EVANS: *The combination of twin operations. A modification of the Kohlrausch method of determining refractive indices.* The observing instrument is a microscope placed vertically and fitted with a Bertrand lens. An immersion theodolite stage of the Klein type is used so that the substance under investigation may be rotated beneath a liquid of higher n about two axes, the first at right angles to the optical axis of the instrument, and the second at right angles to the first and to the plane surface of the object. This is observed thru the natural surface of the liquid, and rotated in either direction until the position of total reflection is reached. By rotation of the object about the second axis the refractive indices in all directions parallel to the plane surface may be determined, and the values of the principal refractive indices thus obtained. A. HOLMES AND DR. H. F. HARWOOD: *The basalts of the Brito-Arctic Province.* MISS N. HOSALI exhibited some models of crystals constructed by herself.—*Nature,* **98**, 222–223, 1916.

THE ROYAL SOCIETY OF GREAT BRITAIN

London, November 2, 1916; SIR J. J. THOMSON, president, in the chair.

SIR WILLIAM CROOKES: *The photographic spectra of meteorites.* Thirty rare earthy meteorites, mostly acquired thru the courtesy of the British Museum Trustees, have been examined. The examination has revealed the presence of unexpectedly large traces of Cr in all the specimens, a condition quite different from that found in the siderites or meteoritic irons, where Cr is practically absent. The proportion between Cr and Ni remains constant in 26 out of 30 aerolites, and is clearly shown in the photographs. In but 3 nickel is almost absent. From the experience gained it has been possible to make a mixture containing known quantities of Ni and Cr, which, with the addition of Fe, produces a spectrum in the neighborhood of the Cr group that is practically identical with that produced by the aerolite Aubres.—*Nature,* **98**, 221, 1916.

NEW MINERALS

LORETTOITE

Roger C. Wells and Esper S. Larsen, of the U. S. Geological Survey: *Lorettoite, a new mineral. J. Wash. Acad. Sci.*, **6**, (20), 669–672, 1916.

Name: From the locality, Loretto, Tennessee.

Physical Properties

Color: honey yellow, (Ridgway). Streak: strontian (pure) yellow, (Ridgway). Cloudy due to minute gas bubbles. Luster: adamantine. Form: compact masses of coarse fibers or blades. H. about 3. Sp. Gr. 7.6. Fusibility, about 1.

Crystallographic and Optical Properties

Probably tetragonal with a perfect basal cleavage. Optically—. Sensibly uniaxial, the optic axis being normal to the cleavage. $\omega_{Li}=2.40$; $\epsilon_{Li}=2.37$.

Chemical Properties

Comp. approximately 6 $PbO.PbCl_2$.

Easily soluble in hot dilute HNO_3; slowly soluble in hot HCl, with the separation of lead chloride. Decomposed slowly by H_2SO_4. Analysis by Wells gave: insoluble 0.58, PbO 93.98, Cl 3.98, P_2O_5 0.11, CaO 0.48, MgO 0.56, Al_2O_3 0.08, ZnO 0.31, CO_2 0.20, Br,I,F none, H_2O 0.03, sum 100.31, less O eq. of Cl 0.90 = 99.41. A second determination of Cl gave 4.09.

Found at Loretto, Tennessee, and a single specimen (without locality) in the collections of the University of California. S. G. G.

EL DORADOITE

S. L. Watkins, of Pleasant Valley, California: *List of Minerals*, 1916.

Name: After locality, El Dorado County, California.

General character: A variety of quartz, usually blue of various tints, also sometimes yellow or bronze.

Occurrence: Occurs in a coarse grained pegmatite.

Description: No scientific description of this material appears to have been published, but Mr. Watkins has furnished the following descriptive notes:

El Doradoite runs thru various shades of color, blue predominating. The blue shades run from the faintest perceptible shading of water color blue to light blue, cobalt blue, dark blue, deep amethystine blue and vivid black blue, also there are beautiful grades of milky blue, opalescent blue, and smoky blue. In the same formation is a lode which yields a beautiful silvery colored mineral, which also varies into rich straw color and into a copper-yellow colored stone. This type of el doradoite, of greatest brilliancy and clearness, is cut into facetted stones. The copper-yellow variety when cut resembles a drop of liquid gold, flashing with many colored fires of light. The silvery transparent blue variety makes a wonderfully showy gem, as it has the same blue-white, silvery fires that the best diamonds possess.

El Doradoite occurs in a granite formation at an altitude of 6000 feet above sea level. In mining we take out blocks of sometimes tons in weight, but for gem purposes the clearer portions only are used. Some blocks are so transparent that objects can be seen distinctly thru 12 or 14 inches of solid material; a remarkable feature is that one block of material may be intensely clear and transparent and the one resting on this may be of a dark smoky tint, and the one on top of that a clear straw color. As depth is attained the amethystine shades predominate and there is less clear material.

ABSTRACTS OF MINERALOGIC LITERATURE

NEW MINERAL NAMES. [Second list]. W. E. FORD, of Yale Univ. *Am J. Sci.* [4], **42,** (6). 504–505, 1916.

A descriptive alphabetical list of six new mineral names, which have appeared or been noticed since the publication of the previous list (June, 1916). Of these, one (*leifite*) appeared in 1915, and has not been noted in *Am. Min.*, but descriptions of the others have been fully abstracted herein. The assignment of the authorship of *spencerite* to Prof. Phillips is apparently erroneous, as it was announced by PROF. T. L. WALKER at a meeting of the Mineralogical Society (London) on June 20th, 1916 (See *Am. Min.* **1,** (3), 48–49, 1916). S. G. G.

BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY FOR 1915. JOHN M. NICKLES. U. S. Geol. Survey, *Bull.* **615,** 144 pages, 1916.

This work includes Mineralogy. It is to be regretted that it was not made a 10-year bibliography. S. G. G.

INTERNATIONAL CATALOGUE OF SCIENTIFIC LITERATURE. G. MINERALOGY, INCLUDING PETROLOGY AND CRYSTALLOGRAPHY; London, 1916.

THE EMERALD DEPOSITS OF MUZO, COLOMBIA. EDGAR T. WHERRY. *Bull. Am. Inst. Mining Eng.* (Aug.) **1916,** 1869–1870. Discussion of the paper by J. E. POGUE (*Am. Min.* **1,** (3), 70, 1916). It is suggested that the emerald crystallized out only in the upper of the two formations at the locality because by the time the circulating solutions began to deposit emerald all cavities in the lower formation had been filled up, and the solutions could only get into the upper one. S. G. G.

SOME NEW FORMS OF NATROLITE. ALEXANDER H. PHILLIPS, of Princeton University. *Am. J. Sci.*, [4] **42** (6), 472–474, 1916.

Natrolite crystals were found at the contact of a nephelite-syenite, and a limestone. Some of the crystals are very large and individually developed, forming reticular masses with angular cavities; individual crystals measure 6 cm. in length and 4 cm. in diameter. A second generation of small water-clear crystals is implanted upon the large milky and translucent ones. These are very rich in forms, with bright and perfect faces. 38 faces, representing 13 forms, were measured on one such crystal only a millimeter in diameter. The following new forms were observed: *e* (210), *r* (130), *o* (151), *t* (531). The larger crystals are very simple in development. S. G. G.

A RECENTLY FOUND IRON METEORITE FROM COOKEVILLE, PUTNAM COUNTY, TENNESSEE. GEORGE P. MERRILL, of the U. S, National Museum. *Proc. U. S. Nat. Mus.*, **51,** 325–326, 1916.

An octahedrite which weighed 2,132 grams before cutting. S. G. G.

PREPARATION AND PROPERTIES OF LEAD CHLOR-ARSENATE, ARTIFICIAL MIMETITE. C. C. McDonnell and C. M. Smith, of the Bur. Chem., U. S. Dept. Agr. *Am. J. Sci.* [4], **42,** 139–145, 1916.

Crystals were prepared by dissolving $PbHAsO_4$ in dilute HCl, nearly neutralizing with NH_4OH, and pouring into a large volume of water; larger ones were made by nearly precipitating the same solution with $Pb(C_2H_3O_2)_2$ and allowing to cool. The product is yellowish white, and has sp. gr. = 7.15 and the refractive indices $\omega = 2.16$, $\epsilon = 2.13$; optically uniaxial, —. It contains somewhat more Cl than natural mimetite. E. T. W.

THE SAPPHIRE MINING INDUSTRY OF ANAKIE, QUEENSLAND. Anonymous. *Bull. Imp. Inst.* **14,** 253–261, 1916. Abstract by R. L. Sibley, reprinted by permission from *Chem. Abstr.* **10,** 3048, 1916.

A brief account is given of the nature, mode of occurrence, and mining of sapphire. Evidence tends to show that the sapphire was weathered out of basalt. The sp. gr. of the gems varies from 4.0 to 4.05. The hardness is also variable, some parts of the specimens having a hardness greater than 9. One type of dark violet-blue stone is black when first cut, but shows a greatly increased transparency after heating to redness.

THE FORMATION OF THE OXIDIZED ORES OF ZINC FROM THE SULFIDE. Yinchang Tsenshan Wang, of New York. *Trans. Am. Inst. Mining Eng.*, **52,** 657–710, 1916.

From thirteen experiments and microscopic study of thin sections, the author concludes that: 1. Sphalerite is first attacked by the oxidation products of iron sulfides before the formation of secondary minerals containing zinc; 2. The formation of the oxidized ores rarely occurs by direct replacement of sphalerite; 3. Normal zinc carbonate (smithsonite) is formed when the reagents in solution are bicarbonates; and basic zinc carbonate (hydrozincite) is formed when the reagents are normal carbonates; 4. Limestones may be replaced in nature by a solution of a zinc salt, usually the sulfate; 5. In nature both smithsonite and calamine replace limestones; 6. No free carbon dioxide can be present where silicates and carbonates of zinc occur, and conversely, these minerals of zinc do not appear where free carbon dioxide is present; 7 "Amorphous calamine" may be formed from solutions of silicate and hydroxide under ordinary conditions; 8. Calamine in nature is probably formed by steps, and is precipitated from waters containing ions of some gelatinous silicate and of hydroxides; 9. It is evident that calamine is formed under ordinary conditions in nature, but time is a great factor in the process. Until this factor is satisfied we can hardly expect the production of crystals of calamine by wet methods; 10. Minute crystals of calamine may be formed by heat at or below 900°C. from a chemical mixture; 11. No confirmation is here offered of the change of calamine and smithsonite to willemite and zincite by heat, other than that heat produces changes of optical characters of willemite and zincite respectively (altho the author found that when water is driven from calamine by heating, the product shows fluorescence when exposed to burning magnesium ribbon, tho less strongly than willemite). S. G. G.